MILLIMETER-WAVE SPECTROSCOPY OF METHOXYMETHANOL

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Methoxymethanol (CH_3OCH_2OH), a ten atoms molecule, is a very interesting candidate for the detection in the interstellar medium since it can be formed by the reaction between both possible radicals of methanol: CH_3O (already detected in the ISM) and CH_2OH. It could be also formed by addition of CH_3O on formaldehyde (another detected compound in the ISM) followed by the addition or abstraction of a hydrogen radical. According to quantum chemical calculations, methoxymethanol has three stable conformations: *Gg*, *Gg'*, and *Tg*. The most stable *Gg* conformation has a small dipole moment of 0.27 D, whereas two others conformations *Gg'* and *Tg* are considerably less stable (8.5 kJ/mol and 10.9 kJ/mol respectively), but have much greater dipole moments (2.47 D and 2.17 D respectively). Thus, in the room-temperature rotational spectra the three conformations may have approximately the same line intensities. We measured the rotational spectrum of methoxymethanol between 150 and 500 GHz and detected all three conformations. The major difficulties in the spectral analysis consist in the very dense spectrum of methoxymethanol and low signal-to-noise ratio of the lines, and in different large amplitude motions. The methyl top internal rotation splittings were observed for the rotational lines of *Gg* and *Gg'* conformations. The doublet structure of *Tg* conformation rotational lines may be explained by -OH group tunneling between two equivalent gauche configurations. The analysis is in progress, the latest results will be presented. *The support of the "Action sur Projets de l'INSU PCMI, and ANR-13-BS05-0008-02 IMOLABS" is gratefully acknowledged*